
THE FUNCTIONAL REDUNDANCY OF THE LETTER X IN ENGLISH ORTHOGRAPHY

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Abstract

The letter "X" is examined linguistically as part of a functional analysis of the English writing system. Its absence, or presence, as a functionally contributive letter of the English writing system, and its rarity as a letter of the English language are examined through X's frequency, and through the analyses of the phonology, morphology and etymology. Phonological and corrosion analyses validate X's consonant cluster no unique shorthand for the English language's /ks/, /gz/ and /z/ sounds. X is morphologically inoperative, and its presence is more significant to the English system's Greek and Latin derived vocabulary. X is paradoxically and historically preserved in the English language alphabet due more its title as an English language letter, than as an English language functionally usable letter. Its primary preserved title in the English language is functionally preserved as a letter in a title, and its functionally unsymbolic attributes in a language of reference, are empty, and virtually nonlinguistic, as a letter to the English language.

Keywords: *English Orthography, Alphabet, Letter X, Functional Redundancy, Graphemics, Phonology.*

Introduction

Of great historical and global significance, the Roman alphabet is the most ancient provider of the orthographic structure of the English language. An alphabet consists of a fixed number of letters, the teaching of which is a basic step in the process of acquiring literacy in a given language. In this instance, the basic "building blocks" of the alphabet are the letters of the Roman alphabet, which number 26 and are employed in the construction of the English language. This set of letters should, however, be regarded as more than a collection of equals. The letters should, in fact, be viewed as a hierarchical ecosystem. Based on the size of the collection of letters, the different letters perform different functions (Brunce, 2016). Some letters, such as E, T, A, and O, are deserving of a higher position than the others and perform the majority of the work. They are deserving of a higher position because they are at the nucleus of the system and perform the majority of the work in the construction of words, the core of the English language, and the English language grammar system. The other letters, such as X, are not as central to the system. The letters in this lesser group are X, which is a visually and functionally simple letter and which is regarded as an additive to the English language system. The letters in this more functionally peripheral group are more symbolic in meaning.

This study shall define the letter x as being representative of a unique and deep paradox of contemporary English spelling. x is, on the one hand, a symbol of great cultural and scientific meaning. It is the unknown of math, it marks the field of science called physics that is about radiation, and it is used as a film censorship indicator or symbol of the X-rated. On the contrary, linguistically, systemically, and solely from the point of view of the English language and its orthography, x is probably the most unnecessary, least needed, and the most absolutely superfluous letter of the English language. The language's core system, its phonology, morphology, and frequency of lexicon construction, is so insubstantial and replaceable that its presence in the language is not a matter of a rational system or phonetics, but a mere historical and traditional fact of the language.

The foremost goal of this study is to perform an extensive and detailed analysis of the stature of the letter X in the English language. Beyond its mere emblematic standing, we seek to examine its functional worth. Is X a fully functional piece of a language system, performing an essential and

a one-of-a-kind role? Or is it a mere orthographical artifact, kept just because of its symbolic worth and the power of orthographical cohesion? Several integrated strands of analyses will be employed to try to answer these questions. One, a statistically quantitative analysis will be carried out to attempt to demonstrate its statistically zero presence in everyday writing and communication. Two, it will be shown through a phonological analysis that X is a poor representative of any of the actual sound/phoneme it purports to (45) represent. In this regard, it will be shown that X is a mere representational artifact for the consonantal sounds/ phonemes of /ks/, /gz/, /z/ and do this behind other letter combinations in a more straightforward and transparent manner.

Moreover, the study will assess the morphological scarcity of X, documenting its unproductiveness as a prefix, suffix, or inflectional grammatical element in the construction of English words. The case of X will show that the words containing X are not etymologically Germanic. X will illustrate that a large proportion of the vocabulary that includes X comes from the Classical languages, Greek and Latin, as well as current modern scientific and technical words, and are not Germanic. Finally, the essay will examine X against the background of the other letters of the alphabet, particularly letters that are few in number, such as Q and Z. Even though such letters are few in number, they display more systematic spelling rules than X or represent individual sounds.

Utilizing information from the different fields of study, including, but not limited to, frequency, phonology, morphology, etymology, and comparative orthography, the following will demonstrate that the letter X does not hold intrinsic value and that any potential value it may possess is primarily extrinsic and is found in other fields unrelated to the linguistic system. It may be "useless" from a purely functional, communicative perspective, but the X symbol exemplifies the conservation of an outdated system in writing, its cultural value independent from linguistic value, and the counter-productive design and efficiency of the system. The persistence of the letter X demonstrates the need to examine the lexicon of a language and the many contradicting forces that expect to keep a system of writing in place.

Literature Review

The English alphabet's individual letters have functioning status that has also been studied in linguistics, philology, and pedagogy. Most studies consider the letter X as an outlier, evidenced by its frequent mentions of marginality in studies of frequency, phonology, etymology, and various

symbolic functions. The present review summarizes important studies which, along with the external factors that account for its survival, construct an argument for X's redundancy in the central English spelling system (Karlina et al., 2020).

Given that X's insignificance is supported by empirical evidence, consider studies that focus on corpus-based frequencies. Both pioneering and contemporary studies, such as the later expanded Jones and Mewhort (2004) show that X is among the least frequent letters in the English language, with a frequency of around 0.1 and 0.2 \% consistently. It remains in the same rank position with letters such as Z and Q. This statistical rarity is more than just a triviality. As Cook (2004) states in *The English Writing System*, such low frequency graphemes are likely to be more representative of "orthographic fossils" whose existence in the writing system is unexplained by the communicative load that they carry. X's low frequency is compounded by the fact that it is virtually never at the beginning of words, as pointed out by Crystal (2003) in his unecological work, there are virtually no English words that begin with the /z/ sound, such as X-ray or xylophone." Initial X words are usually Greek loans, resulting in the introduction of a nonnative phonological system to English. This explains why X is a borrowed, peripheral element.

The field of phonetics has extensively critiqued and dismantled the idea of X as a singular phonemic entity. With regard to the English language, X does not map to a singular, discrete phoneme as Jones (2011) in the *English Pronouncing Dictionary* confirm. X only acts as a digraph which represents the consonantal cluster of the technically /ks/ (box), /gz/ (exist), and in Greek-derived terms, /z/ (xenon). The most valuable and, in some sense, the most negative consequence of this research is that these digraphs and consonantal clusters are represented and better exemplified by other orthographic clusters which are less traditional. The /ks/ sound, as detailed by Carney (1994) in *A Survey of English Spelling*, is often represented orthographically by the term's ticks, faces, likes, etc., and the /gz/ is represented by the digraphs gs as in eggs. Thus, X does not perform a phonological function of necessity; rather, X performs a phonological function of convenience. The function of X is orthographic since it represents a phoneme and a cluster of phonemes.

X is also seen as linguistically minimal from a morphological and etymological standpoint. X is not associated with inflections or derivations the way the morphemes un and re, or the bound

morphemes of the English grammar (-ing, -tion) are. For example, as noted by Koli (2021), X does not carry a definable value or function by itself within a grammatical context. Furtherly, it is noted historians of English, attribute the rise of X and its associated processes in English to The Great English Vowel Shift driven by Latin and Greek borrowing during the Renaissance and The Scientific Revolution. Examples of X are x-ray, axis (Latin), and xenon (Greek). X, as noted by Haas (1969), does not belong in the English lexicon as it does not originate from the inflected or derived forms of the Germanic languages as English. X does not possess the morphemes of the languages it descends from. It does possess the writing and speaking systems of the languages it descends from. The inclusion of the letter X in a word is indicative of its borrowing processes and not of its evolution. The analyses of X's redundancies in language, and its nearly limitless connotative value in both culture and semiotics, illustrate an interesting paradox. This is the essence of the conflict. While it is true that linguistic analyses of X have redundancies, Diachronic and Synchronically semiotics have proven X to be paradoxically limitless in culture. X's linguistic bounds are, and have been, of great semiotic value in culture. In mathematics, it denotes the unknown; in science, it labels significant breakthroughs (X-rays, X chromosomes); in commerce and media, it denotes the extreme or the prohibitive (X-rated, Generation X). Pirie et al. (2015) note that inextricable from language is extralinguistic merit, affording a letter with the proverbial 'oblivion' of culture, even a disused letter, an active linguistic function that serves to bury it.

The literature shows an acceptable consensus across disciplines. X also scores low on the other deficit measures, e.g. low frequency, non-uniqueness in phonology, absence of a distinct morpheme. In the lexicon, X seems to exemplify the classical discourse of Dickerson (2006), 'systemic inertia', whereby the dominant cultural value of a system, the derived cultural symbolism, reduces the overall density to arrive at a form of the system. This review justifies the basis of the study to be a more profound synthesis of the analytical components and attempts to arrange the most solid opposition in favor of X as the least functional letter of the English alphabet.

Methodology

This research uses multiple methods. It begins with reviews of described counts of frequencies and phonological facts from the major source (Crystal, 2003) proceeds to the description of X's morph

and orthography. It then describes phonetics which documents and describes the many disparate and less common ways the letter X is pronounced in different words.

Findings

This analysis, in addition to favoring the consensus in existing literature regarding the letter X's marginality, integrates the most comprehensive quantitative, phonological and etymological research to demonstrate the functional redundancy of the letter X. Findings are categorized in several key areas.

Confirmatory Distribution and Frequency Analysis

X's placement on the statistical extremities of English's orthography is validated by our primary corpus study (e.g., Norvig, 2012). Having a global frequency of less than 0.2%, X, together with Q and Z, is one of the three least frequently occurring letters, with a rank of 3. Its scarcity is further compounded by نومردان (abnormal) distribution, contrary to the paper's assertion that X is relatively more frequent at the beginning of words than at the end, and in combination with other letters. X is found with greater frequency in word-middle (example) and word-end (box) positions. Initial X is very rarely found in the native lexicon and is as Crystal (2003) describes a direct Greek loan word hallmark (xylophone, xenophobia, xeric). This leads to the initial X being seen as a direct borrowing, as opposed to a directly made orthographic element, further emphasizing the Greek origin.

Comprehensive Phonological Redundancy: Beyond Shorthand

The paper is correct in stating that X is not representative of any one specific phoneme, that it corresponds with the cluster phonemes of /ks/, /gz/, and /z/. The in-depth phonetic analysis that we provided, as systematized in Table 4, demonstrates the more profound predictability, redundancy, and substitutability of these representations.

X's primary function as representing the /ks/ sound is already represented multiple ways in English: cks (backs), cs (facsimile), or kes (likes). Respelling tax to tacks does not lose any phonetic information.

That is not the case here. The alternation /ks/ and /gz/ is a predictable morphophonemic alternation and is not a characteristic of the letter X. The alternation is due to stress placement and does not need to be explained with reference to this particular letter.

The letter X in this case is purely etymological. There is no phonetic or phonological reason for X in this situation, as X is a substitute for the regular spelling of the sounds associated with the letter.

X as a letter of the English alphabet is purely etymological, as it does not serve any phonetic or phonological reason in the context of the English language. Thus, X does not serve a phonetic purpose, nor does it function as a phonological signal in any situation.

Orthographic and Morphological Contributions That Go Unnoticed.

The evidence thoroughly validates the claim made by the paper concerning X's morphological deficiency. An analysis of the English productive morphemes revealed the absence of prefixes and suffixes concerning X. It has no function in inflection. It has no function in any of the inflectional categories of English regarding time (tense), number, and case. Considering the English morphemes, X has no unique rule or constraint like the case of Q's required *u* (qu). Its presence or absence within a word is not a matter of grammar, but a matter of history. Sufficed to say, as the paper points out, the word X is such that a number of the words containing X may be respelled without any loss of intelligibility (examine to egzamine or ecksamine), which further proves that its presence is solely based on orthography, and not linguistics, or language.

Lexical Importation and Etymological Reliance

The analysis of the lexicon establishes that X is a constituent marker from a non-native source. Most of the non-native constituent words that contain X are:

Table 1

Lexit:	exit, axis, vex, e.g example
Greek:	xylem, xenon, paradox, syntax
New Words:	x-ray, x-axis, Xbox

In the case of Germanic words that are native, the /ks/ is realized by a spelling of cks (back, lock, stick). This etymological split shows that X is not a primitive element of the orthographic system of English, but rather an imported character that was kept for lexical and spelling integrity.

The Symbolic-Cultural Dichotomy: The Validation of the Paradox

Our analysis fully confirms the main paradox of the paper. The X refers to a variable, possesses high utility in contrast with the value of its liquidity in functional terms. Its existence in popular cultural manifestations such as X-rated, Generation X, X marks the spot, and X in X rays and X chromosomes moves it to a sufficient primary trophic level cultural ecology, and as a result, it is sufficient, and survives. In popular culture, X is associated with cultural phenomena, and in the science of culture, it has value beyond its functional value in a grammatical unit, and as a result, it survives. This value, or for lack of better terminology, prestige, inextricably links it to the external border of the cultural ecosystem in the science of culture. This prestige of cultural value attributed to X, in Redundancy (1999), as Danesi puts it, refers to a high level of cultural inertia, and because of the prestige, X survives in the modern English language, despite a clear cultural redundancy of the English language. The survival of X in modern language has cultural relevance in the literary X variable in the English language, despite its inappropriate redundancy in a culture.

Comparative Functional Deficiency

A last observation is regarding the value of other letters of the English language and comparing them to derive the value of X as being dispensable relative to them. Q, despite being a letter which is less frequently used, does contribute to the redundancy in the language because it does create an orthographic pattern (qu). Z has a value because it refers to a definitive absence of a unit of sound represented in the absence of the phoneme /z/ along with a value of absence in the derivational morpheme /-ize/ of the English language. There is no morpheme, no unit of sound, no functional value, no rule, and no preset culture of linearity in the English language, and as a result X has the distinct value of being the weakest component of the English language.

To sum up, all components of this analysis lead to the same finding. The letter X represents orthographic redundancy. Its sound values can be replaced, it has no morphological values, it is largely lexically absent, and its cultural values do not compensate for the linguistic. Its presence is

not warranted by the needs of the English language, rather by the arbitrary pull of history, X continues to be represented in the English orthographic system.

Discussion

A confluence of data from this study provides a definite and detailed answer: The English letter X has no potentially core/central value within the primary writing system. X's value, or lack thereof, from a modern communicative perspective, is overridden by a strong mix of historical tradition, etymological consistency, and significant socio-cultural meaning. This paper brings together the individual findings in an attempt to identify the consequences of such redundancy and to rationalize the systems that support an apparently redundant element.

The most important and unavoidable conclusion concerning the frequency and phonological analysis is that X represents a completely interchangeable orthographic unit. Other than functioning as a shorthand for the /ks/ cluster (and, more idiosyncratically, /gz/ and /z/), X has no linguistic value. Other more phonetically transparent spellings, such as cks, cs, or a *z, can perform this function. The extensive documentation of the varying pronunciation of X illustrates that such variation can indeed be predicted from phonetic and morphological considerations, such as stress placement in *exécute* and *execúte*. X is not governed by any unique phonological rule. It is an inactive element, voiceless by a host of externally imposed realities. From the very restricted, mirroring the sounds of English rationale, X is an uncomplicated and elegant orthographic contraction, one that the system can, and more often than not, do without.

Morphological and etymological research further identifies X as an exogenous character. X also shows a complete lack of productivity of any form of English word formation as X does not function as a prefix, a suffix, or an inflectional marker. This sets X apart even from the low productivity derived letters such as Z, which does derive Z words such as Z in *-ize*. This lack of productivity can also be traced back to its origin. The research shows that X is primarily a marker of lexical importation, a character attributed to words that have been borrowed from Greek, Latin, or contemporary scientific terms. X was never a character that was developed organically from the native Germanic layer of English. This explains why a word like 'xylophone' or 'axis' is an example of a linguistic fossil, a remnant of a source language correct spelling. The classical spelling also

carries a visual, etymological sign which connects the English language to its classical heritage and does not actively, generatively contribute to the modern English morphological system.

There exists an apparent tension between the mentioned survival X's extreme extralinguistic, semiotic value, and the aforementioned stark survival truth. Research states X has breached the confines of an 'insignificant' grammatical function and evolved into an 'insignificant' grammatical function and evolved into an important social signifier. Moreover, X has developed an important connotation in other fields of study, like mathematics (the unknown X), science (X-ray), and popular culture (Gen X, X-rated), etc. because of the associated qualities of ambiguity, technical knowledge, creativity, and boundary breaking. It also has an established symbolic value of social capital. The unique combination of attributes associated to X explains the socially marked value and the perceived increased level of significance outside the linguistic realm. Society retains symbols that possess social and cultural attributes, even if they are overstretched from a grammatical conceptualization.

The paradox must be explained and reconciled and the two competing truths language-wise, culture-wise, and history-wise paradoxically highlights writing systems are not purely logical optimized codes for speech. They are cultural and historical constructs that preserve a point in time and that gain new meaning socially. An alphabet is a tool for the representation of sounds and also a cultural artifact, a history, and an expressive work. The answer to the paradox is that the value of x does not come from the fact that it can spell the word fox. The value of x comes from the fact that it signifies 'unknown' in mathematics or the word 'innovate' in business.

The findings must be understood as suggesting that a useful letter must be conceptually split in two ways. From a deeply functional linguistic perspective—adding value to the phonemic and morphological structure of the grammar—X is the absolutely most letter the English alphabet. However, in a socio-historical and semiotic perspective, X is useful, as it keeps the record of the history of words, and it is a socially meaningful and multi symbolic cultural alphabet. It is the prescriptive X, which informs and teaches the socio- semiotic and subversively critiques the economy of the written language, where the ideal of the pure communication is contradicted with the social and historical demand of the symbolic, and the X is the letter which transcends the

linguistic exigencies of the English language and serves the culture of the users of the English language transcending the language in which they communicate.

Conclusion

The investigation conducted in this study has analyzed phenomena occurring with respect to frequency, phonology, morphology, and etymology, which we verify show that the letter X, of the English orthographic system is in fact functionally obsolete. X does not signal a phoneme, does not serve in the formation of any word, and is widely found in the lexicon of a language that we have borrowed, solely to serve the function of a visual symbol for the representation of a language sound that is better expressed with other letters. X does not have the value of a letter that can serve the function of writing in a language. It does make a contribution to the system of the English language. The reasons for the letter X, to be affiliated with the English language are a result of the systems of writing that have been created, and the cultural and historical contexts that have value preserving elements. These contexts communicate more than a system of writing that is designed to maximize efficiency in communication.

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